 0030-0950/83/0001-0034 $2.00/0

HERRING GULLS NESTING IN ARTIFICIAL GOOSE-NESTING STRUCTURES[1]

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ABSTRACT. Herring gull (*Larus argentatus*) nesting in artificial goose-nesting structures was documented at the Winous Point Shooting Club, Port Clinton, Ohio, 1974–78. Gulls and Canada geese (*Branta canadensis*) nested in 14–28% and 12–23% of the structures, respectively. Gulls nesting in the structures did not influence goose nesting. Clutch sizes and egg-laying dates were synchronous with other local populations of herring gulls and Canada geese. Aggressive interactions between geese and gulls resulted in geese dominating the structures.

OHIO J. SCI. 83 (1): 34-37, 1983

INTRODUCTION

Artificial structures have provided additional nesting sites for Canada geese since 1944 (Yocum 1952); however, nesting in these structures by species other than waterfowl has not been documented. Herring gulls commonly nest in colonies but have been known to nest solitarily on inland lakes and marshes (Wynne-Edwards 1962). Monaghan and Coulson (1977) reported solitarily nesting herring gulls on roof tops in Great Britain. Herring gulls have been observed nesting in artificial nesting structures in Ottawa County, Ohio, at Magee Marsh Wildlife Area (K. Bednarik, pers. comm.), Ottawa National Wildlife Refuge, and the Winous Point Shooting Club. The objectives of this study were to document herring gull nesting in artificial structures and to record interactions between gulls and geese nesting in the structures.

METHODS AND MATERIALS

The study was conducted between 1974 and 1978 at the 1,680-ha Winous Point Shooting Club, Port Clinton, Ohio. The proportions of artificial structures used by nesting gulls and geese during 1974–75 were based on single, midsummer observations. Nesting structures were checked 3 times during the 1976 and 1978 breeding seasons, and 4 times in 1977.

Nesting structures were similar to the Model B type used by the Ohio Division of Wildlife (Bednarik 1970, fig. 1). Twelve structures supported by steel fenceposts were placed over water in summer 1973. In winter 1976, 18 structures were placed over land, 4 of them on stumps and 14 attached to standing trees. All structures were elevated 1–3 m and straw was added before each nesting season. Tree limbs were trimmed around the structures. Ice destroyed 8 structures during the study.

The average initial egg-laying date was defined as the average of the dates the first egg of each clutch was laid. Dates were determined by back dating

[1]Manuscript received 18 August 1981 and in revised form 4 June 1982 (#81-38).

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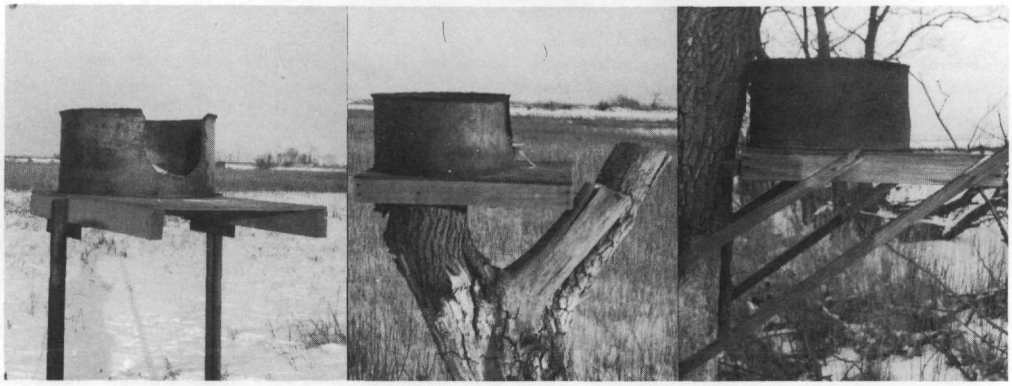

FIGURE 1. Artificial nesting structures used by herring gulls and Canada geese at Winous Point Shooting Club, Port Clinton, Ohio, 1974-78.

partially hatched clutches, pipped eggs, or downy young. Laying periods of 24 h and 48 h per egg, and incubation periods of 29 and 31 days for geese and gulls, respectively, (Schoonover et al. 1970, Tinbergin 1960) were used to estimate dates of nest initiation. The Chi-square and Wilcoxon rank sum tests were used to statistically test differences between artificial nesting structures and average initial egg-laying dates.

RESULTS

Herring gulls used the structures the first spring after installation, nesting in 3 structures in 1974 and 6 in 1975. Canada geese nested in 3 structures in 1975. The combined proportions of structures occupied by gulls and geese during the nesting season were consistent from 1976 to 1978 (table 1). However, during this period, gull use decreased from 28 to 14%, whereas the percentage used by geese increased from 12 to 23%, respectively.

During the 1976-78 nesting seasons, herring gulls nested in 44% of the structures over water, 31% of those on tree stumps, and 7% of those attached to trees; geese nested in 22, 31, and 12%, respectively. Due to the small sample size, it was inappropriate to statistically compare structure use by year or species. However, when combined, structures attached to standing trees were used significantly less ($P < 0.005$) than the other structures.

The average clutch sizes of gulls and geese were consistent from 1976 to 1978 (table 2). Clutch sizes were not recorded during the 1974-75 nesting seasons. The average initial egg-laying dates of gulls and geese did not overlap (fig. 2). Canada geese nested significantly ($P < 0.001$) earlier than gulls during 1976-78. In 1975, 3 structures contained eggs or eggshells of both species. In 1976-77 aggressive interactions between gulls and geese resulted in geese dominating the

TABLE 1

Percent of artificial structures used by nesting herring gulls and Canada geese. Structures were placed over water (I), on tree stumps (II), and attached to the sides of trees (III) at the Winous Point Shooting Club, Port Clinton, Ohio, 1976–78.

Year	N[a]	Gulls	Geese
1976			
I	6	66.7	16.7
II	4	25.0	25.0
III	15[b]	13.0	6.7
Average		28.0	12.0
1977			
I	7	42.9	28.6
II	4	25.0	25.0
III	14	7.1	14.3
Average		20.0	20.0
1978			
I	5	20.0	20.0
II	5[b]	40.0	40.0
III	12	0.0	16.7
Average		13.6	22.7

[a]Number of structures
[b]Renest recorded as additional structure

TABLE 2

Mean and standard deviations of clutch sizes of herring gulls and Canada geese nesting in artificial structures at the Winous Point Shooting Club, Port Clinton, Ohio, 1976–78.

Year	Clutch size	
	Gulls	Geese
1976	2.71 ± 0.45	6.00 ± 0.00
N[a]	7	1
1977	2.60 ± 0.49	6.00 ± 0.00
N	5	4
1978	3.00 ± 0.00	6.40 ± 1.01
N	3	5
Total	2.73 ± 0.20	6.20 ± 0.72

[a]Number of nests

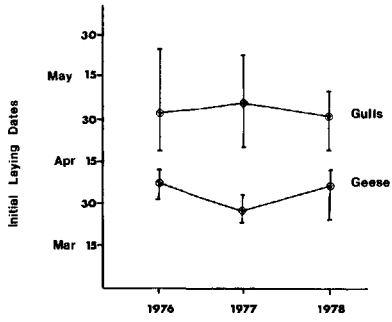

FIGURE 2. Mean and range of initial egg-laying dates of herring gulls and Canada geese nesting in artificial structures at Winous Point Shooting Club, Port Clinton, Ohio, 1976-78.

structures. Gulls used the structures as perches before the ice on the marsh was completely thawed. They deposited nesting material in the structures before geese drove them away. After the geese hatched their own clutches, the gulls returned to successfully hatch 2-egg clutches.

DISCUSSION

In Montana, Craighead and Stockstad (1961) reported that geese used 24.6% of the structures the authors placed in natural conditions. Atkins and Fuller (1979) reported a 37.5% use rate of structures in Minnesota. In my study, decrease in gull nesting was not related to the increase in goose nesting, but was instead a direct result of dike reconstruction. Several successful gull nests which became inactive in later years were located within 10 m of active draglines. Most of these successful nesting structures were located near open water. A possible explanation for the low use of structures attached to standing trees is that most are located near the drier periphery of the marsh.

Clutch sizes of gulls nesting in structures were similar to clutch sizes of gulls in the Lake Erie region. Gilman et al. (1977) reported 2.96 eggs per nest in a Lake Erie herring gull colony in 1975. Herring gull nests averaged 2.4 eggs in 1977 in a colony on West Sister Island, Ohio (R. W. Parris, pers. comm.). Clutch sizes of tub-nesting Canada geese at Crane Creek-Ottawa National Wildlife Refuge Complex, Oak Harbor, Ohio, were 5.56, 5.04, and 5.69 in 1976, 1977, and 1978, respectively (K. Bednarik et al. 1976, 1977, 1978).

Initial laying dates for gulls nesting in structures were similar to peak laying dates reported by Gilman et al. (1977). This suggests that gulls we observed nested slightly later than other Great Lakes colony gulls. Initial laying dates of geese were later than dates for tub-nesting geese at the Crane Creek-Ottawa National Wildlife Refuge Complex, in which average initial laying occurred on 8 March 1976, 15 March 1977, and 19 March 1978 (K. Bednarik et al. 1976, 1977, 1978).

Average clutch sizes and initial egg-laying dates were not felt to be significant in explaining gull nesting in artificial structures or the aggressive interactions between the 2 species. Most interactions between gulls and waterfowl referenced in the literature have been gull predation on waterfowl (Odin 1957, Knuth 1968, Vermeer 1968). Gulls nesting in artificial structures had no effect on goose nesting success in this study.

The reasons for solitary nesting of herring gulls in the southwestern Lake Erie region are not understood. Monaghan and Coulson (1977) suggested that solitary roof nesting herring gulls in Great Britain were

either from large colonies or from natural sites near saturation. Lack (1968) hypothesized that rather than select sites safe from predation, Larinae selected for availability. Inadequate nesting sites do not logically explain solitary nesting in southwestern Lake Erie. West Sister Island, located 14.4 km north of the Magee Marsh Wildlife Area, has an active non-saturated colony of herring gulls.

Lack (1968) proposed that solitary nesting of a species occurs where food supplies are insufficient to support a colony. Structure-nesting gulls appear to overlap feeding areas of colonial-nesting and non-breeding gulls. Although gulls may obtain some food from the marshes, they primarily feed along the shore of Lake Erie and its bays.

Changes in territorial behavior are difficult to explain in structure-nesting gulls which become intolerant of other gulls in the area. There appeared to be an increase in territory size compared to colonial-nesting birds. On several occasions I observed paired gulls defending a structure from intruding gulls which were over 15 m from the structures.

Solitary nesting may be perpetuated by environmental imprinting of young gulls. Herring gulls are sexually mature at 3 years (Moore 1976) and may return to nest in structures. Ludwig (1963) showed a high rate of return of adult herring gulls to natal colonies. This attachment to nesting sites occurs within the first weeks of life (Noseworthy and Lien 1976). McNicholl (1975) suggested nest site tenacity was strongly developed in larids in highly stable habitats but greatly reduced in unstable habitats. Artificial structures offer a stable habitat, relatively free from predation and fluctuating water levels.

ACKNOWLEDGMENTS. I thank R. L. Meeks for initiating the study, R. A. Farney for recording observations during 1974-75, and the Winous Point Shooting Club for providing the opportunity to conduct the study.

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